



Food Surveys Research Group
Dietary Data Brief No. 60
May 2024

Cheese Consumption by U.S. Children and Adolescents

What We Eat in America, NHANES 2017 - 2018

Rhonda S. Sebastian, MA; Joseph D. Goldman, MA; and
Alanna J. Moshfegh, MS, RDN

Highlights

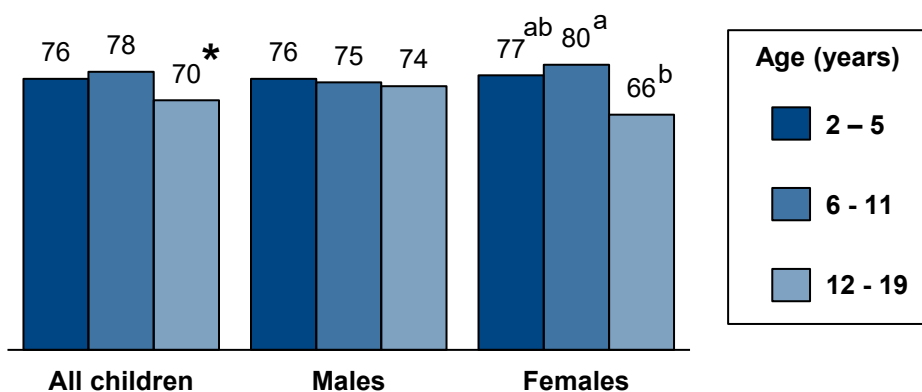
- ▶ Seventy-four percent of children consume cheese, alone or as an ingredient, on any given day. Intake does not differ by gender, but there is an inverse trend in prevalence of cheese consumption by age.
- ▶ A lower percentage of non-Hispanic Asian children consume cheese compared to children in other race/ethnic groups.
- ▶ Grocery stores are the source of the majority (53%) of cheese consumed.
- ▶ Mean daily intake of cheese is 30 grams/day. Mixed dishes, e.g., sandwiches and pizza, account for 78% of total intake.
- ▶ Six in ten children consume a mixed dish containing cheese on any given day.
- ▶ Cheese consumers have higher mean total intake of energy, total fat, saturated fat, and calcium than non-consumers.
- ▶ Among consumers, cheese accounts for an average of 7% of total daily intake of energy, 13% of protein and total fat, 21% of saturated fat, and 30% of calcium.

Cheese is a rich source of calcium and vitamin D, two nutrients that are under consumed in the U.S. diet. However, it also contains considerable amounts of saturated fat and sodium, which are consumed in excess (1, 2). Cheese is eaten alone, but it is also a common ingredient in foods, e.g., sandwiches, pizza, tacos. Consequently, measuring dietary intake of cheese is challenging. To date, total dairy intake has been reported in “cup equivalents”, a term that makes sense for milk and yogurt but less so for cheese (3, 4; see definition of “cup equivalents” on page 8). The purpose of this report is to characterize cheese intake- inclusive of cheese consumed as an ingredient- by U.S. children 2 – 19 years. Intake estimates in grams (g) are included. This analysis is based on one day of dietary intake data from What We Eat in America (WWEIA), National Health and Nutrition Examination Survey (NHANES) 2017- 2018. A complementary report (Dietary Data Brief No. 61) describes cheese intake among U.S. adults.

What percentage of children consume cheese, and does it differ by gender and age?

On any given day, 74% of children 2 – 19 years consume cheese (75% of males and 73% of females). An inverse linear trend in the percentage consuming cheese by age was found among all children ($p < 0.001$; Figure 1). Moreover, the percentage of females 6 -11 years consuming cheese is higher than that of females 12-19 years.

Figure 1. Prevalence (%) of cheese consumption among children 2 - 19 years, by gender and age, WWEIA, NHANES 2017 - 2018



*For all children, inverse linear trend in cheese consumption by age ($p < 0.001$) based on regression analysis.

^{a,b}Within gender, percentage estimates with different superscripts differ by age ($p < 0.001$) based on a two-tailed *t*-test.

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2-19 years of age.



U.S. DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Beltsville Human Nutrition Research Center
Food Surveys Research Group

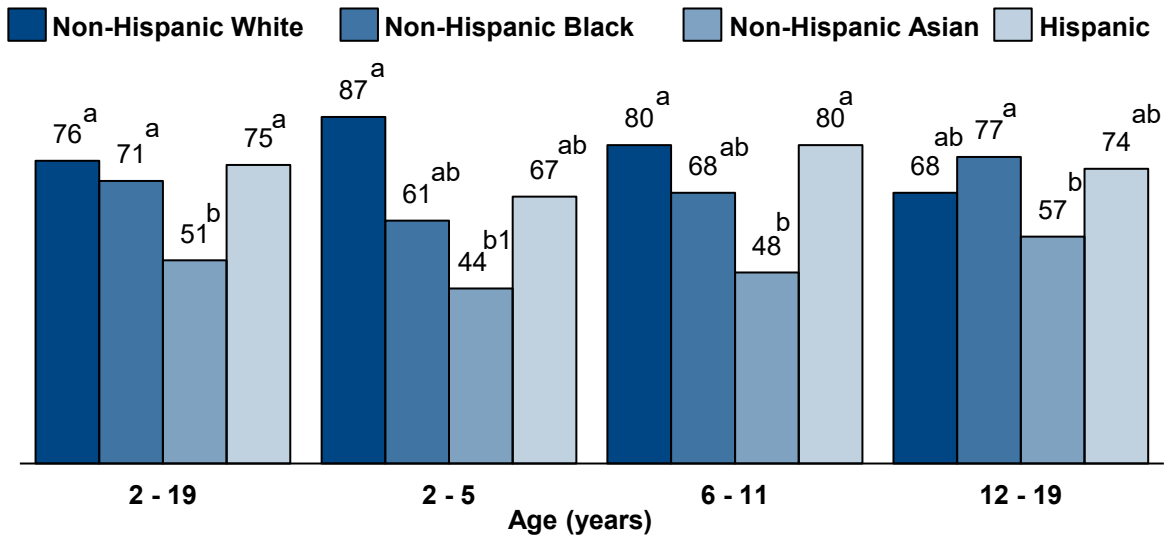
www.ars.usda.gov/nea/bhnrc/fsrg

Does the prevalence of cheese consumption differ by race/ethnicity or family income?

Compared to non-Hispanic (NH) White, NH Black, and Hispanic children, NH Asian children are less likely to consume cheese on the intake day (Figure 2). Within age group, the prevalence of cheese consumption was lower among NH Asian children versus one or more other race/ethnic groups.

As shown in Figure 3, there are no statistically significant differences in the prevalence of cheese consumption by family income ($p>0.001$).

Figure 2. Prevalence (%) of cheese consumption among children 2-19 years, by age and race/ethnicity, WWEIA, NHANES 2017- 2018

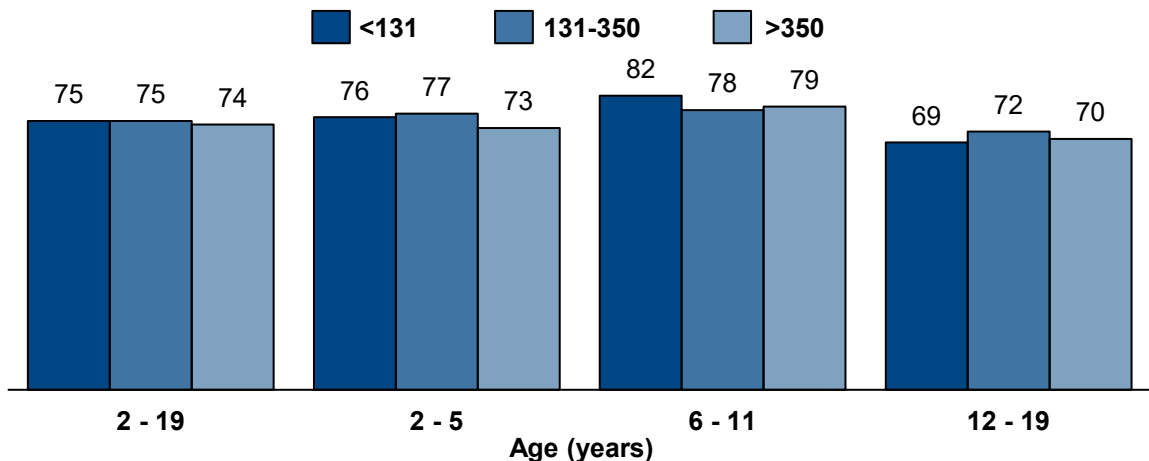


^{a,b}Within age group, percentage estimates with different superscripts differ by race/ethnicity ($p<0.001$) based on a two-tailed t-test.

¹Estimate is less precise than others due to small sample size.

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2 - 19 years of age.

Figure 3. Prevalence (%) of cheese consumption among children 2 - 19 years, by age and family income as % of poverty level¹, WWEIA, NHANES 2017- 2018



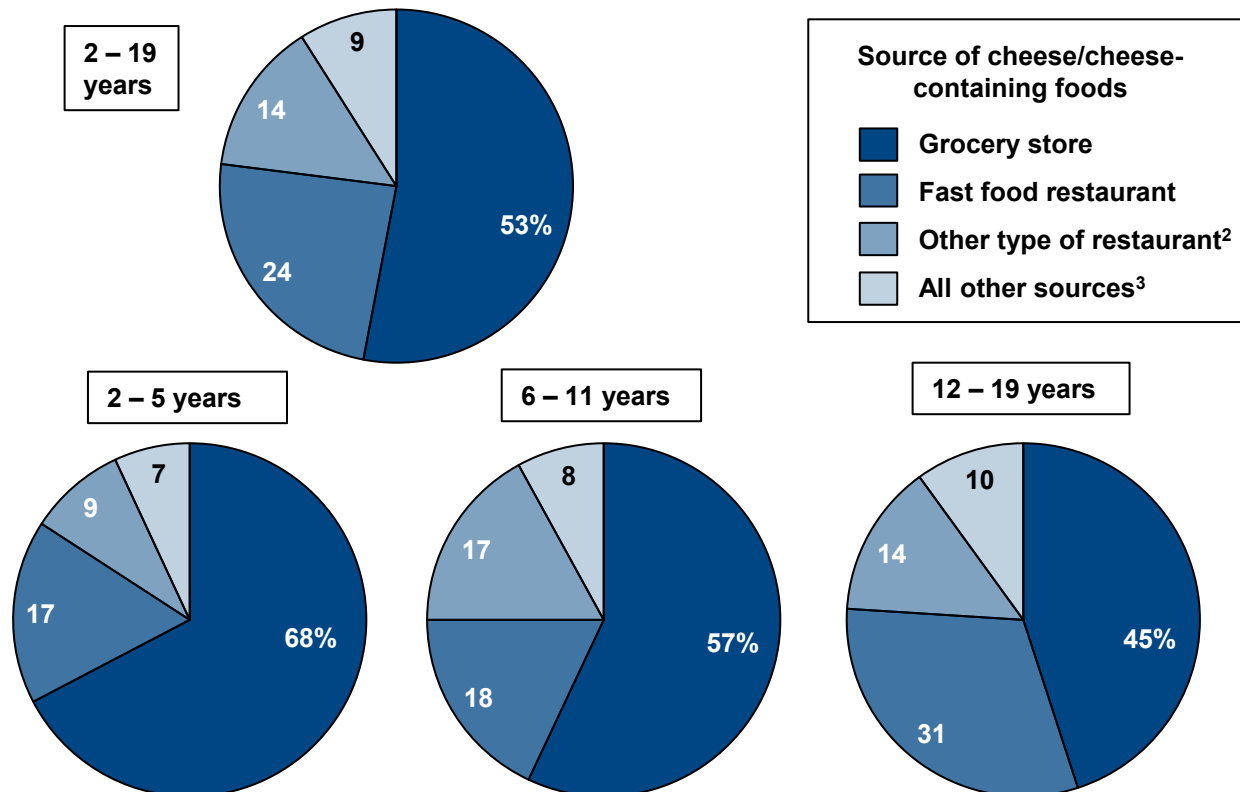
¹Ratio of family income to the federal poverty guidelines expressed as a percentage. See definition of “family income” on page 8.

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2 – 19 years of age.

From what sources is cheese obtained?

Overall, 53% of cheese consumed by children is obtained from a grocery store (Figure 4). That source accounts for about two-thirds of cheese among those 2-5 years old. In contrast, among adolescents 12-19 years, the percentages of cheese obtained from grocery stores and restaurants (fast food and other types) are about equal.

Figure 4. Source¹ of cheese among children 2 - 19 years, by age, WWEIA, NHANES 2017- 2018



¹Percentages may not add to 100 due to rounding.

²Includes restaurant with waiter/waitress service; cafeteria (including in a K-12 school); and restaurant, not further specified.

³Includes sources not specifically shown, e.g., someone else/gift and convenience store.

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2 – 19 years of age.

At what eating occasions is cheese consumed?

The most common eating occasions that cheese/cheese-containing foods are consumed are lunch and dinner (Table 1). When it is consumed, children’s intake averages between 25 and 30 g of cheese at main meals, and about two-thirds of an amount at snacks.

Table 1. Percentage consuming cheese at specified eating occasion¹ and mean intake when consumed at that occasion, children 2-19 years, WWEIA, NHANES 2017- 2018

	Breakfast	Lunch	Dinner	Snack
Children consuming (%)	10	40	41	22
Intake (grams)	25	29	30	19

¹See definition of “eating occasion” on page 8.

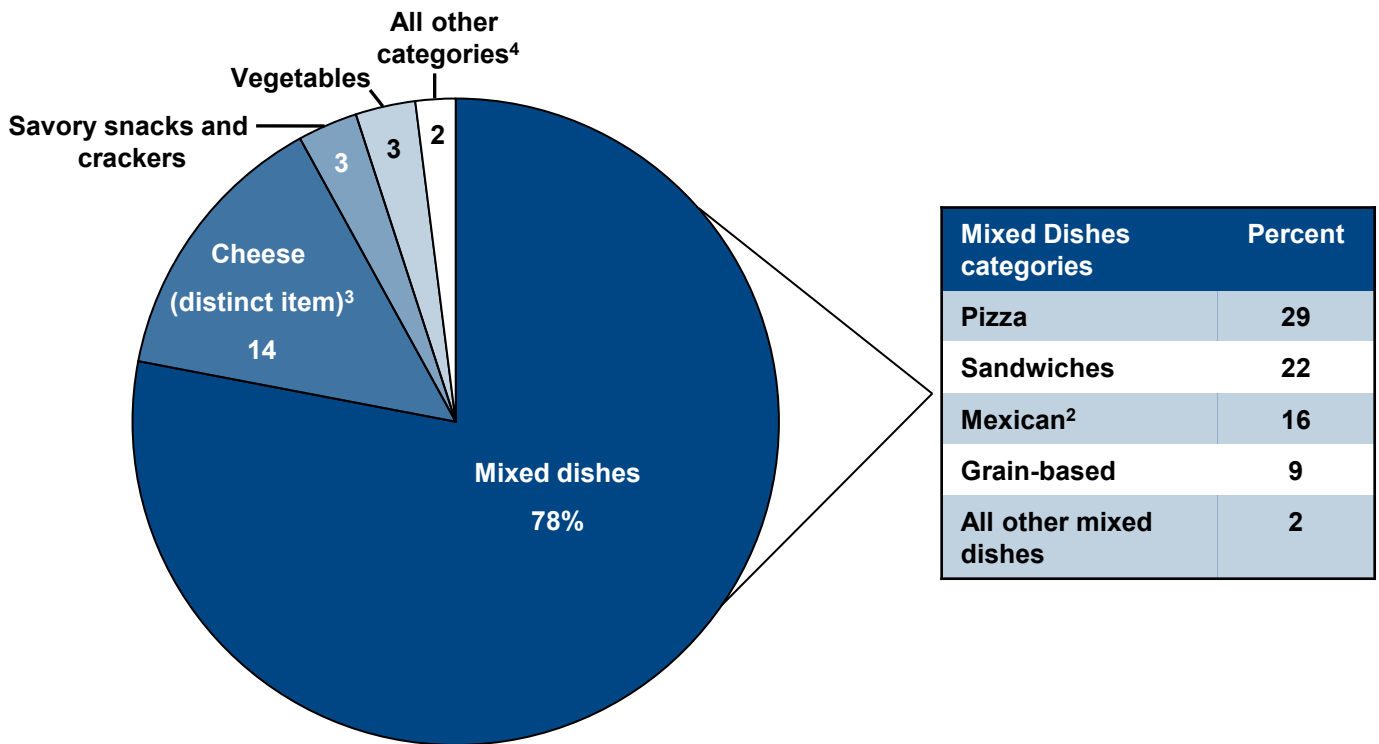
SOURCE: WWEIA, NHANES 2017 - 2018, day 1, adults 2 – 19 years of age.

What types of foods account for cheese intake?

Total mean intake of cheese among all children is 30 grams per day. By age group, average amounts per day are 25 g (2 – 5 years), 30 grams (6 – 11 years) and 33 grams (12 – 19 years).

Mixed dishes account for the majority of cheese intake among children 2 – 19 years (Figure 5). For the youngest children (2 – 5 years), 63% of that intake is from mixed dishes (*data not shown*). For 6 – 11 year old children and adolescents (12-19 years), those percentages are 75% and 85%, respectively.

Figure 5. Percentage of total cheese intake consumed by WWEIA food category¹ among children 2 - 19 years, WWEIA, NHANES 2017 – 2018



¹See definition of “WWEIA Food Categories” on page 8.

²Includes foods such as tacos, burritos, and quesadillas.

³Denotes cheese consumed that is not an ingredient in a multi-ingredient food or added to another item. Examples are a cheese stick or a dish of cottage cheese.

⁴Includes Protein foods (1%) and Grains (1%).

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2 – 19 years of age.

In what food categories is cheese commonly consumed?

The percentage of children consuming cheese-containing foods by food category and the average amount of cheese per report within that category provides an in-depth look at food sources of cheese intake. Table 2 shows the food categories from which a notable percentage of children consume a cheese-containing item. Relatively high reporting rates and substantial cheese content among many of the mixed dishes categories make clear why they account for a large proportion of total cheese intake.

Table 2. Percentage of children consuming cheese-containing foods in WWEIA Food Categories and mean amount of cheese per report, age 2-19 years, 2017 – 2018

WWEIA Food Category ¹	Consumers ² of cheese-containing item(s) in specified category (%)	Mean amount of cheese per report (grams) ³
Mixed Dishes	60	28
Sandwiches	23	25
Burgers	8	21
Deli/cured meat	8	26
Egg/breakfast	4	19
Cheese	4	33
Pizza	19	39
Mexican	13	31
Burritos and tacos	8	31
Grain-based	15	17
Pasta dishes, excludes macaroni and cheese	7	17
Macaroni and cheese	7	14
Snacks and Sweets	17	5
Crackers	10	6
Savory snacks	7	3
Cheese (distinct item)³	12	33
Cheese, natural and processed	12	32
Vegetables	6	15
Vegetables, excluding potatoes	5	15
Lettuce/lettuce-based salads	3	13
Protein Foods	3	14
Grains	2	10

¹See definition of “WWEIA Food Categories” on page 8.

²See definition of “consumer/non-consumer on page 8.

³Denotes cheese consumed that is *not* an ingredient in a multi-ingredient food or added to another item. Examples are a cheese stick or a dish of cottage cheese.

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2 – 19 years of age.

Does intake or nutrients per 1,000 kilocalories differ between cheese consumers and non-consumers?

There are few nutrient intake differences between cheese consumers and non-consumers on a 1,000 kilocalorie basis (Table 2). Children who consume cheese on any given day have higher intake of saturated fat and calcium per 1,000 kilocalories. Those same differences are seen among children 6-11 years and adolescents 12-19 years, but not among those 2-5 years (*data not shown*). None of the nutrients shown are significantly lower among cheese consumers on this basis.

Table 3. Mean daily intake of energy and selected nutrients per 1,000 kilocalories¹ by cheese consumption² status among children 2 – 19 years, 2017 – 2018

Energy/Nutrient	Cheese consumer	Cheese non-consumer
Macronutrients/food components:		
Protein (g)	36	35
Carbohydrate (g)	128	136
Added sugars (tsp eq.)	8	10
Dietary fiber (g)	8	8
Total fat (g)	40	36
Saturated fat (g)	14*	11
Cholesterol	118	123
Vitamins:		
Vitamin A (mcg RAE)	327	291
Vitamin B12 (mcg)	2	2
Vitamin D (mcg)	3	3
Minerals:		
Calcium (mg)	564*	444
Sodium (mg)	1563	1522

Abbreviations: g, grams; tsp eq, teaspoon equivalents; mcg, micrograms; RAE, retinol activity equivalents; mg, milligrams.

¹See definition of “consumer/non-consumer” on page 8.

²See definition of “kilocalories” on page 8.

*Intake is significantly different by cheese consumption status ($p < 0.001$) based on a two-tailed t-test.

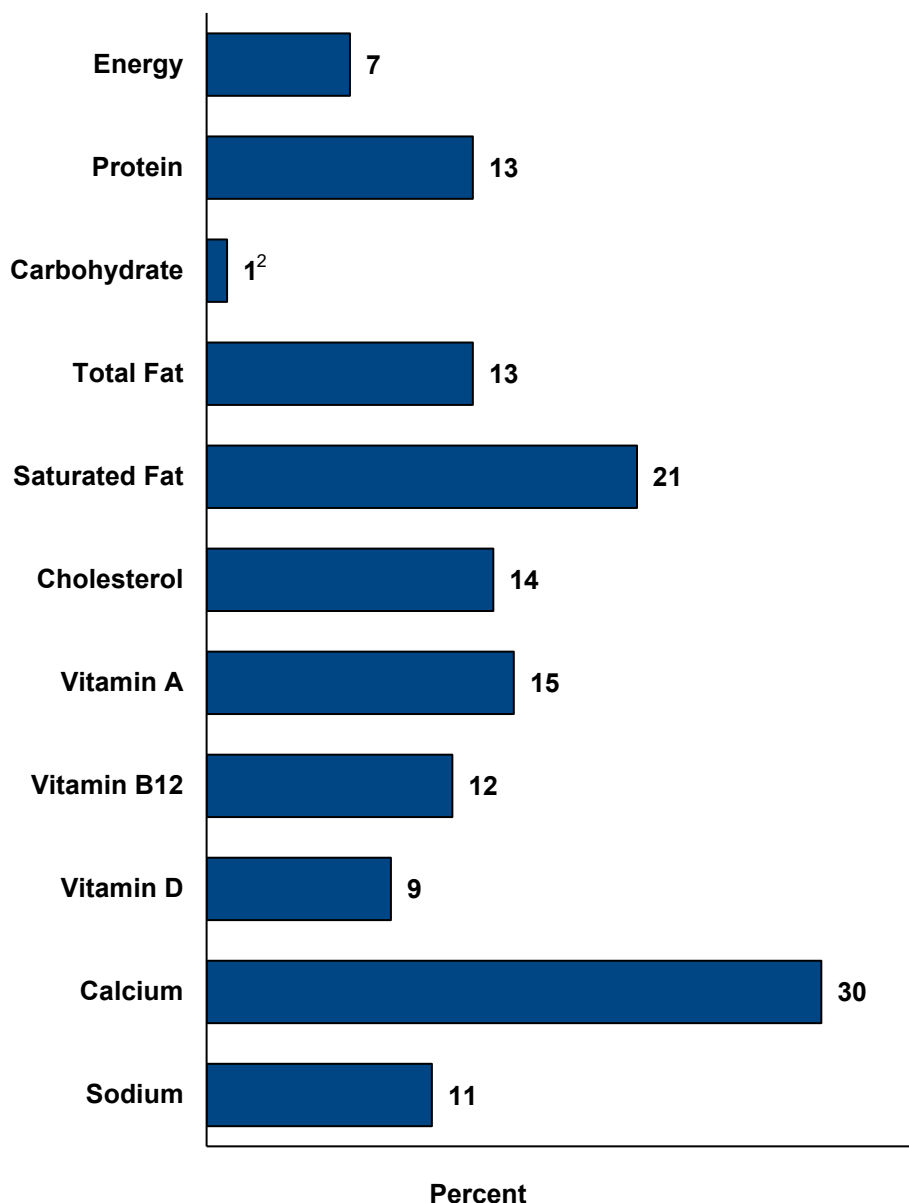
SOURCE: WWEIA, NHANES 2017 - 2018, day 1, children 2 – 19 years.

Among consumers, how much does cheese contribute to total daily intakes of energy and nutrients?

On any given day, cheese contributes an average of 138 kilocalories to dietary intake of children 2-19 years. By age group, that average is 109 kilocalories for children 2-5 years, 127 kilocalories for those 6-11 years, and 161 kilocalories for adolescents 12-19 years (*data not shown*).

Figure 6 shows that among all children and adolescents, cheese accounts for 7% of mean total energy intake. However, its contribution to other nutrients shown- specifically saturated fat and calcium- is much higher. On the other hand, cheese contributes 2 percent or less to total daily intake of dietary fiber, added sugars, and potassium (*data not shown*).

Figure 6. Contributions of cheese to total daily intakes of energy and selected nutrients among cheese consumers¹, children 2 – 19 years, 2017 – 2018



¹See definition of “consumer/non-consumer” on page 8.

²Estimate less precise than other presented due to small sample size.

SOURCE: WWEIA, NHANES 2017 - 2018, day 1, adults 20 years of age and older.

Definitions

Consumer/non-consumer: In general, anyone who consumed cheese alone or as an ingredient in any type of food was considered a “consumer,” whereas anyone who did not was considered a “non-consumer.” In all, 1,721 children were classified as cheese consumers (848 males and 873 females), and 659 were classified as non-consumers (326 males and 333 females). Classification as a consumer or non-consumer for this analysis has no implications as to habitual consumption.

Cup equivalents: a standard that determines comparable amounts of various foods in a food group for the purpose of comparing dietary intake to national recommendations (1). In the dairy group, one cup equivalent is the amount of food considered equal to 1 cup of milk. In general, 1 cup of yogurt equals 1 cup equivalent of dairy. However, translation of cheese amounts to cup equivalents of dairy varies both by cheese type (e.g., natural, processed, cottage) and the specific cheese within that type (e.g., for natural cheese, Swiss, cheddar, blue). The ranges of cheese amounts that constitute one cup equivalent of dairy are as follows: natural cheese, 1 to 2 ounces; processed cheese, 1-1/2 to 2 ounces; cottage cheese, 4-1/2 to 10-1/2 ounces (5). (Note: 1 ounce = 28.35 grams). National intake estimates of cheese in cup equivalents are available at www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/fped-data-tables/.

Eating occasion: Designated by the respondent, eating occasions with the following English and Spanish names were grouped together: breakfast, desayuno, and almuerzo; lunch, brunch, and comida; dinner, supper, and cena; and snack, drink, merienda, entre comida, botana, bocadillo, tentempie, bebida, and items consumed over an extended period of time. The time an eating occasion occurs has no implications as to its type, e.g., breakfast occasions could occur at all times of day and night.

Family income (as percentage of poverty level): the ratio of family income to poverty expressed as a percentage. The Department of Health and Human Services’ poverty guidelines were used as the poverty measure to calculate the ratio (6).

Kilocalories: Scientific unit used in reporting the energy content of food; shortened to “calories” in casual usage in the U.S.

WWEIA Food Categories: Available at www.ars.usda.gov/Services/docs.htm?docid=23429 is a full list of the WWEIA Food Categories, a scheme for classifying each food and beverage reported in WWEIA, NHANES into one of 169 mutually exclusive categories. In contrast to the WWEIA Food Categories’ item-by-item classification, this analysis classified as a group any foods or beverages that were represented in the dietary data by two or more items linked as having been consumed together. In such cases, all of the linked items were classified together into the most appropriate WWEIA Food Category. For example, a ham and cheese sandwich represented in the dietary data as white bread, deli ham, American cheese, and mayonnaise would be assigned to the “deli and cured meat sandwiches” group, along with similar sandwiches that were not represented by multiple items, i.e., the “single-code sandwiches” that make up the WWEIA Food Category “mixed dishes - sandwiches (single code) – deli and cured meat sandwiches.”

Data source

Estimates in this data brief are based on one day of dietary intake data from WWEIA, NHANES 2017-2018 (7). Day 1 dietary data were collected in person using the 5-step USDA Automated Multiple-Pass Method for the 24-hour recall. A total of 2,380 individuals 2 - 19 years of age (1,174 males and 1,206 females) provided complete and reliable dietary intake data. In the race-specific analyses (see page 2), individuals who were multi-racial or of a racial group other than those listed (240 children, of whom 181 were cheese consumers) were excluded. Likewise, in the income-specific analyses (also on page 2), individuals with missing family income information (229 children, of whom 145 were cheese consumers) were excluded. Sample weights were applied in all analyses to produce estimates that were representative of the U.S. population for the years of collection. Intakes of energy and nutrients were calculated using the 2017-2018 version of USDA's Food and Nutrient Database for Dietary Studies (8). Intake of added sugars was calculated using the Food Patterns Equivalents Database 2017-2018 (5).

References

1. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines 2020-2025*. 9th edition. December 2020. https://www.dietaryguidelines.gov/sites/default/files/2021-03/Dietary_Guidelines_for_Americans-2020-2025.pdf. Accessed January 12, 2024.
2. USDA Agricultural Research Service. *Food Data Central*. <https://fdc.nal.usda.gov>. Accessed January 3, 2024.
3. USDA Economic Research Service. *Ag and Food Statistics: Charting the Essentials. Food Availability and Consumption*. <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-availability-and-consumption/>. Accessed November 30, 2023.
4. Cifelli CJ, Fulgoni K, Fulgoni VL III, Hess, JM. Disparity in dairy servings intake by ethnicity and age in NHANES 2015-2018. *Curr Dev Nutr*. 2022;7(2):100010. doi: 10.1016/j.cdnut.2022.100010.
5. USDA Food Surveys Research Group. *Food Patterns Equivalents Databases and SAS Datasets*. www.ars.usda.gov/fsrg/fped/download. Accessed December 11, 2023.
6. U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. Poverty guidelines. <https://aspe.hhs.gov/poverty-guidelines>. Accessed October 31, 2023.
7. Centers for Disease Control and Prevention, National Center for Health Statistics. *NHANES Questionnaires, Datasets, and Related Documentation*. <https://wwwn.cdc.gov/nchs/nhanes/>. Accessed October 31, 2023.
8. USDA Food Surveys Research Group. *FNDDS Documentation and Databases*. www.ars.usda.gov/fsrg/fndds/download. Accessed November 30, 2023.

About the authors

Rhonda S. Sebastian, Joseph D. Goldman, and Alanna J. Moshfegh are with the Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, MD.

Suggested citation

Sebastian RS, Goldman JD, Moshfegh AJ. *Cheese Consumption by U.S. Children and Adolescents: What We Eat in America, NHANES 2017- 2018*. Food Surveys Research Group Dietary Data Brief No. 60. May 2024.

Copyright information

All material appearing in this report is in the public domain and may be reproduced or copied without permission. However, citation as to source is appreciated.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

